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Docket No.

2160 (FJ-99-36)

Serial No.

09/437,554

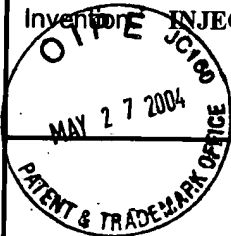
Filing Date

November 10, 1999

Examiner

M. Patterson

Group Art Unit

1772Inventor: **INJECTION BLOW-MOLDED DISPOSABLE TUMBLER AND METHOD OF MAKING SAME**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Re Application of:

Erland R. Sandstrom et al.

U.S. Serial No. 09/437,554

Filed November 10, 1999

Docket No. 2160 (FJ-99-36)

For: INJECTION BLOW-MOLDED
DISPOSABLE TUMBLER AND
METHOD OF MAKING SAME

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Examiner: M. Patterson

Group Art Unit: 1772

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BRIEF ON APPEAL

Sir:

Applicant submits herewith, in triplicate, its *Appeal Brief* in the above-noted United States Patent Application. This *Appeal* is from the *Final Rejection* of December 1, 2003. A *Notice of Appeal* was submitted on February 26, 2004. Please charge the fee for the *Brief* to our Deposit Account No. 50-0935. A *Petition* and fee for a one-month *Extension of Time* was filed on April 30, 2004 along with an *Amendment After Final Rejection*. If any additional extensions or fees are necessary, please consider this a *Petition* therefore and charge any fees to our account as aforesaid.

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1. REAL PARTY IN INTEREST

Fort James Corporation, 1650 Lake Cook Road, Deerfield, Illinois 60015, a subsidiary of Georgia-Pacific Corporation, is the real party in interest in this patent application. The claimed subject matter was developed by its Dixie® Division. The *Assignment* was recorded at Reel 010486 / Frame 0491 on November 30, 1999.

2. RELATED APPEALS AND INTERFERENCE

There are no related appeals or interferences known to Applicant or its legal representatives which will affect or be affected by or having a bearing on the Board's decision in this case.

3. STATUS OF CLAIMS

Claims 1-4, 6, 9-24, 26, 29-44, 46, 48, 50, 77-85, 90 and 91 are on appeal. The other claims have been canceled. A complete listing of the *Claims on Appeal* is provided in Appendix A hereto.

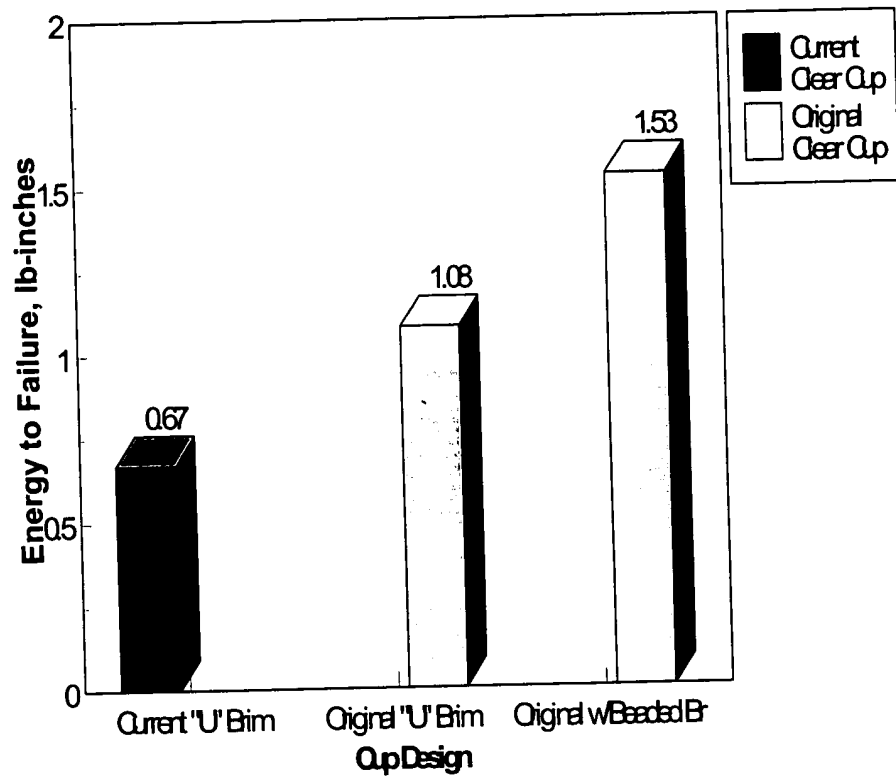
4. STATUS OF AMENDMENTS

An *Amendment After Final Rejection* was filed on April 30, 2004 subsequent to the *Final Rejection* of December 1, 2003. A *Supplemental Amendment* was filed May 3, 2004 to correct typographical errors. This *Appeal Brief* assumes entry of those *Amendments* which were directed to typographical errors and the like only.

5. SUMMARY OF INVENTION

The present invention is directed to an injection blow-molded disposable tumbler provided with a substantially straight sidewall as well as a solid brim. These features provide adequate rigidity as well as surprising impact resistance as is seen in **Figure 3** of the *Declaration of Erland R. Sandstrom* of January, 2003:

Energy to Initial Bim Failure Versus 16 oz Cup Bim Design



The conventional "U" shaped brim of injection blow-molded tumblers had brim energies to failure of 0.67 and 1.08, whereas a comparable invention disposable cup had a brim energy to failure of 1.53, more than 100% and 50% higher, respectively. This is an important feature for shipping and handling. Likewise, the solid beaded brim was much preferred by test panelists and did not require substantial modification to manufacturing assets as is seen in the *Sandstrom Declaration*.

Claim 1 is representative of the subject matter of this application:

1. An injection blow-molded tumbler formed from a polymeric material comprising:
 - (a) a base defining a base diameter forming the bottom of said tumbler, the base also defining an outer edge thereof;
 - (b) a sidewall integrally formed with said base extending upwardly from the outer edge thereof defining about its upper extremity an opening having a diameter generally larger than the base diameter provided with a fortified rim integrally formed with the sidewall in the form of a continuous solid polymer bead;

wherein said fortified rim has a thickness from about 1.5 to about 6 times the thickness of the adjacent portion of said sidewall and wherein the volume of the injection blow-molded tumbler is from about 1.5 to about 4 times the volume of an injection molded parison from which it was prepared, and wherein further the sidewall defines a substantially straight profile extending between the base and the upper opening defined thereby.

For the reasons discussed below, all claims are believed allowable.

6. ISSUES

A. Whether the claim features "injection blow-molded" and the expansion of the parison are entitled to patentable weight in the product claims in view of the recent *3M Innovative Properties Co. v. Avery Dennison Corp.* decision, 69 USPQ2d 1050 (CAFC 2003). If so, all claims are believed clearly allowable since all independent claims contain such recitation that differentiates from the art. A copy of the *3M* decision appears as Appendix B hereto.

- B. If the “injection blow-molded” and parison expansion features of the claims are not entitled to patentable weight, whether the ‘337 *Willbrandt* patent anticipates Claims 1, 6, 9, 13-16, 26, 28-29, 33-35, 46, 48, 50 and 90-91.
- C. Whether or not, *prima facie*, the references warrant a conclusion of obviousness with respect to the inventions claimed in Groups I, II and II noted below.
- D. Whether the evidence of record, including impact resistance data and consumer data warrants allowance even if *prima facie*, the references teach the claimed combinations. A copy of the January, 2003 *Declaration of Erland R. Sandstrom* is attached hereto as Appendix C.

7. GROUPING OF CLAIMS

For the purposes of this Appeal:

Group I, Claims 1-4, 6, 9, 16-24, 26, 29, 42-44, 46, 48, 50, 83-85, 90 and 91 stand or fall together;

Group II, Claims 10-15 and 30-41 stand or fall together; and

Group III, Claims 77-82 stand or fall together.

8. ARGUMENT

In the *Final Rejection* of December 1, 2003, most claims of Group I above were rejected as obvious or on the basis of §102(b) over United States Patent No. 5,433,337 of *Willbrandt*, while the remaining claims are rejected on the basis of obviousness over further references, discussed below.

The Examiner noted that *Willbrandt* disclosed injection molding and blow-molding and that little patentable weight was attached to the claim recitation of “injection blow-

molded” and that the volume of the tumbler was “1.5-4 times” the volume of the parison from which the container was prepared. The rejection is contrary to the *3M* case noted above which provides that product claim features are presumed to be structural limitations:

Despite Avery’s arguments to the contrary, the use of “superimposed” in this definition neither transforms claim 1 into a product-by-process claim nor even limits the scope of the claim to a serial method of manufacture; it describes only the structural relationship between the embossing patterns. See Webster’s Third New International Dictionary 2294 (1993) (defining “superimposed” as “layered”). Furthermore, even words of limitation that can connote with equal force a structural characteristic of the product or a process of manufacture are commonly and by default interpreted in their structural sense, unless the patentee has demonstrated otherwise.

3M Innovative Properties Co. v. Avery Dennison Corp. decision, 69 USPQ2d 1055; see Appendix B, p. B7.

There is plentiful evidence that the claimed features are structural limitations supplied by the *Declaration of Erland R. Sandstrom*, notably, paragraph 5 through 8, reproduced below:

5. Injection molded cups may readily be prepared with different thicknesses in different areas, as described in the ‘337 *Willbrandt* patent noted above. These cups are generally prepared by injecting molten plastic into a mold under high pressure and are characterized by a high degree of uniaxial material orientation in the direction of material flow in the mold. That uniaxial orientation is a structural feature which increases strength in the machine direction and results in brittleness in the cross-machine direction.
6. Injection blow-molded cups, such as those of the invention, are prepared in a multistep integrated process by injecting molding a parison and then blow-molding the hot parison with a compressed gas into the desired final shape. The parison is expanded in a radial, but not axial direction. The step of blow-molding the hot parison imparts biaxial orientation to the final product. Biaxial orientation is a structural feature related to the ratio of the volume of the final product to the volume of the parison and imparts toughness to the article as taught in the above-noted patent application.
7. Stretch blow-molding and blow-molding processes typically involve injection molding a parison in an injection molding machine followed by removing the parison from the apparatus and blow-molding the parison in a separate apparatus, unlike the injection blow-molding process described above which

is an integrated process. Stretch blow-molded and blow-molded products often have a very high degree of biaxial orientation because the parison is expanded in an axial as well as radial direction, but typically require neck features such as prominent annular ring to hold the parison in place during the blow-molding step.

8. Thermoformed articles are generally of relatively uniform thickness because they are prepared from sheets of thermoplastic material, vacuum formed into a mold, for example. Thermoformed articles are generally of relatively uniaxial polymer orientation like injection molded articles in many respects.

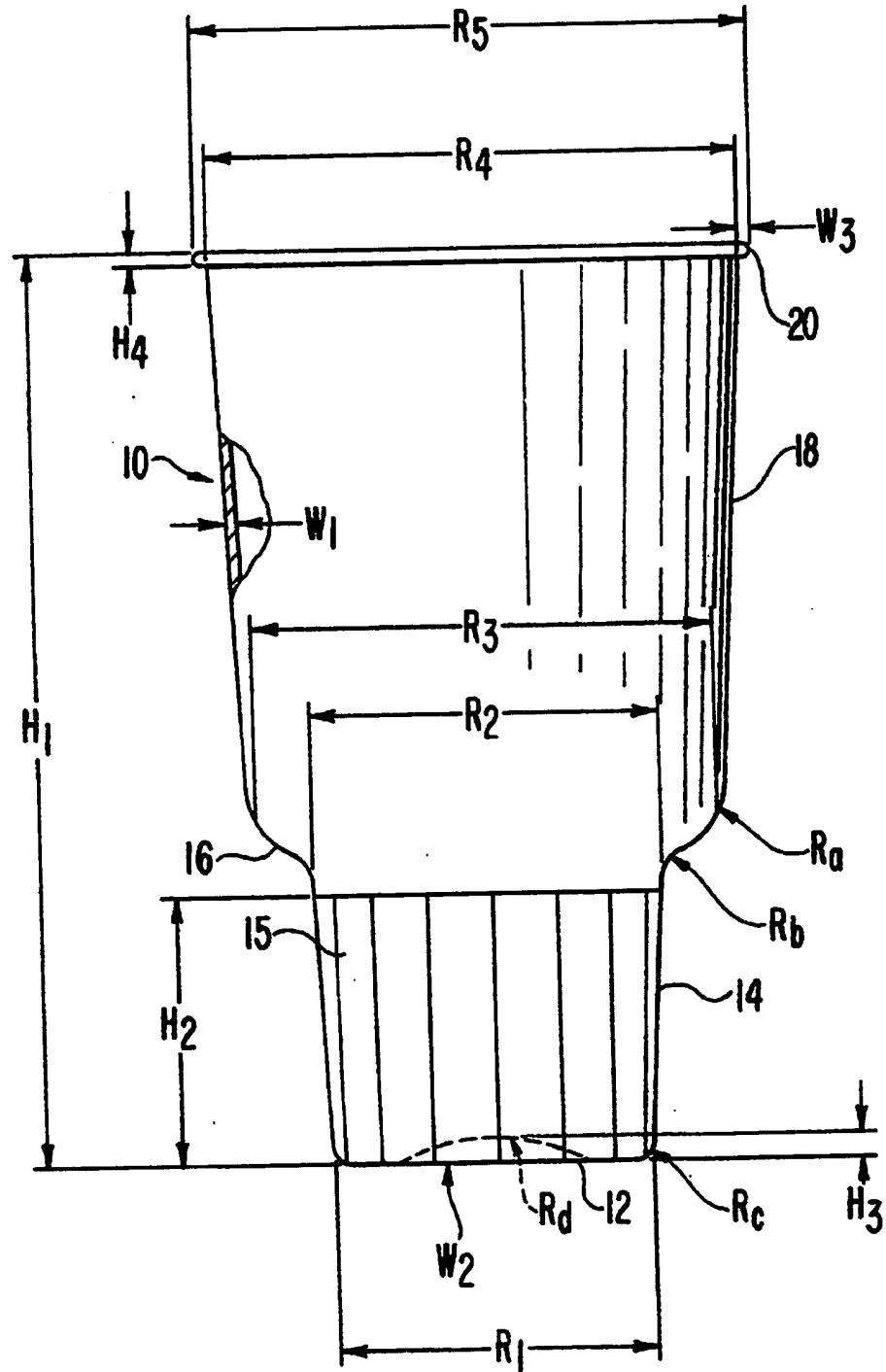
The foregoing paragraphs, especially paragraph 6, makes clear that injection blow-molded cups are structurally distinct from injection molded cups and thermoformed cups because they have biaxial orientation. Their structure depends, in part, on the extent of expansion of the parison, as is claimed. The *Willbrandt* reference has no suggestion at all of an injection blow-molding process as described in this application beginning at page 33 and illustrated at **Figures 9-19**. That process imparts structural features to the product.

All anticipation and obviousness rejections based on *Willbrandt* '337 alone should be reversed in view of the *3M* case, as well as the fact that Applicant has clearly stated that the Claim limitations are product limitations.

2. The Examiner also rejected Claims 1, 6, 9, 13-16, 26, 28-29, 33-35, 46, 48, 50 and 90-91 as anticipated because *Willbrandt* '337 discloses a straight sidewall:

With regard to the newly claimed aspect of the container having a sidewall 'which defines a substantially straight profile extending between the base and the upper opening,' *Willbrandt* discloses a sidewall which defines a substantially straight profile extending between the base and the upper opening (an upper body portion which extends upward toward the rim; column 4, lines 35-53)

Final Rejection, page 3. This rejection is unsupported by the reference which discloses and claims an injection molded cup with a sidewall having **shoulder 16**. Most clearly, the profile is not substantially straight as can be seen from **Figure 1** of *Willbrandt* '337:

FIG. 1

As can be seen from **Figure 1**, the sidewall profile of *Willbrandt* '337 is not straight, and the characterization as such is untenable. *Note also, Willbrandt* '337 at Col. 2, lines 8 through 18:

The container comprises a base, a lower body portion of a size to fit in the standard vehicle container receptacle, the lower body portion extending substantially upward from the base, and an upper body portion of a size such that the container holds the desired amount of a beverage. **A shoulder extends radially outward from the lower body portion and the upper body portion extends substantially upward from the shoulder.** The upper body portion is opened at the top to create an opening. The shoulder aids the container in securely nesting in the vehicle container receptacle.

Accordingly, the anticipation rejections based on *Willbrandt* '337 should be reversed for this reason as well. The tumblers of the invention have straight sidewalls extending from their bottoms to their brims, and that feature is recited in the claims.

Regarding the claims rejected as obvious over *Willbrandt* '337 alone, it is respectfully submitted that the *Willbrandt* '337 reference does not disclose, teach or suggest a tumbler with a straight sidewall profile. All teachings in the reference are to the contrary because a sidewall shoulder is required. A reference that teaches away in a material respect cannot form the basis of an obviousness rejection. *In re Geisler*, 43 USPQ2d 1362, 1365 (CAFC 1997). Accordingly, the claims rejected as obvious over *Willbrandt* '337 alone are allowable whether or not the injection molding and expansion ratio language in the claims is accorded patentable weight.

It is further noted that *Willbrandt* '337 only mentions blow-molding in passing, e.g., Col. 5, lines 29 and following:

The cup **10** can be made by any suitable method known to those skilled in the art, such as injection molding, blow molding, vacuum forming, stretch molding, or thermal molding. The preferred method uses injection molding which is well known to those skilled in the art.

It is seen that from the above passage injection molding, not blow molding is the preferred method; again the reference teaches away from the claims in this application in that there is no product/parison relationship.

For the above reasons, all claims should be allowed. The claims of Group II (Claims 10-15 and 30-41) are additionally patentable because the art does not suggest the claimed subject matter of Claims 10-15 and 30-41. Claims 10 and 36 are illustrative of Group II:

10. An injection blow-molded tumbler formed from a polymeric material comprising:

- (a) a base defining a base diameter forming the bottom of said tumbler, the base also defining an outer edge thereof;
- (b) a sidewall integrally formed with said base extending upwardly from the outer edge thereof having a thickness of from about 5 to about 50 mils defining about its upper extremity an opening having a diameter generally longer than the base diameter provided with a fortified rim integrally formed with the sidewall in the form of a continuous solid polymer bead;
- (c) the volume of said injection blow-molded tumbler being from about 1.5 to about 4 times the volume of an injection molded parison from which it was prepared;

wherein said fortified rim has a thickness of from about 1.5 to about 6 times the thickness of the adjacent portion of said sidewall and

wherein said tumbler has a taper from about 1.0 to about 4.5 degrees, and

- (d) wherein further the sidewall is provided with a molded in design **comprising a series of triangular ridges deeper in dimension than the wall caliper thus providing strength by way of corrugation and having a wall thickness the same as the rest of the tumbler**, and the sidewall defines a substantially straight profile extending between the base and the upper opening defined thereby.

36. An injection blow-molded tumbler formed of an optically clear polymer comprising:

- (a) a substantially circular base portion defining a base diameter, the base portion also defining an outer edge;
- (b) a substantially cylindrical sidewall extending upwardly from the outer edge of the base portion having a thickness of from about 5 to about 50 mils defining about its upper extremity an opening having a diameter generally larger than the base diameter provided with a fortified rim integrally formed with the sidewall in the form of a continuous solid polymer bead;

said sidewall extending upwardly with an angular taper with its central axis of from about 4.5 to about 10 degrees;

said fortified rim having a thickness of from about 1.5 to about 6 times the thickness of the adjacent portion of said sidewall;

said sidewall further including a pattern which alters the cylindrical character thereof over at least a portion of said sidewall which pattern is operative as a grip portion for a user, and

- (c) **wherein further the pattern comprises wall embossments at least as prominent as $\frac{1}{2}$ the caliper of the sidewall**, and the sidewall defines a substantially straight profile extending between the base and the upper opening defined thereby.

While the Examiner rejected Claims 10 and 36 over *Willbrandt* '337 in view of United States Patent No. 4,446,969 to *Tyler*, there is no motivation seen whatsoever to combine the references. It is well settled that the fact that the references can be combined does not make the combination obvious.

Willbrandt relies on a particular construction including a sidewall shoulder for strength (*see* Col. 2, line 36 and following) while *Tyler* '969 relates to a margarine tub and has ridges that help prevent crushing of the container during lidding; that is, axial compression. The problem posed by *Tyler* '969 is entirely different from a drinking vessel where circumferential, rather than axial, stress is likely to be encountered. In any event, *Willbrandt* has already addressed the strength problem with a sidewall shoulder and flutes

and thus has no need for the ridges of *Tyler* '969. The proposed combination is thus redundant and does not come from the references themselves. Accordingly, the factual basis required by *In re Lee* to establish obviousness, *prima facie*, has not been met with respect to Group II alone. In particular, the motivation to combine in the manner urged by the Examiner must appear in the references:

In other words, the Board must explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious.”); *In re Fritch*, 972 F.2d 1260, 1265, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992) (the examiner can satisfy the burden of showing obviousness of the combination “only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references”).

With respect to Lee's application, neither the examiner nor the Board adequately supported the selection and combination of the Nortrup and Thunderchopper references to render obvious that which Lee described. The examiner's conclusory statements that “the demonstration mode is just a programmable feature which can be used in many different device[s] for providing automatic introduction by adding the proper programming software” and that “another motivation would be that the automatic demonstration mode is user friendly and it functions as a tutorial” do not adequately address the issue of motivation to combine. This factual question of motivation is material to patentability, and could not be resolved on subjective belief and unknown authority. It is improper, in determining whether a person of ordinary skill would have been led to this combination of references, simply to “[use] that which the inventor taught against its teacher.” *W.L. Gore v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983). Thus the Board must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the agency's conclusion.

Deferential judicial review under the Administrative Procedure Act does not relieve the agency of its obligation to develop an evidentiary basis for its findings. To the contrary, the Administrative Procedure Act reinforces this obligation. See, e.g., *Motor Vehicle Manufacturers Ass'n v. State Farm Mutual Automobile Ins. Co.*, 463 U.S. 29, 43 (1983) (“the agency must examine the relevant data and articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made.”) (quoting *Burlington Truck Lines v. United States*, 371 U.S. 156, 168 (1962)); *Securities & Exchange Comm'n v. Chenery Corp.*, 318 U.S. 80, 94 (1943) (“The orderly function of the process of review requires that the

grounds upon which the administrative agency acted are clearly disclosed and adequately sustained.”).

In re Lee, 61 USPQ2d 1430, 1434 (CAFC 2002)

If needed, further support is found in the MPEP which specifically provides that “ordinary skill in the art” cannot be a sufficient basis to reject claims.

FACT THAT THE CLAIMED INVENTION IS WITHIN THE CAPABILITIES OF ONE OF ORDINARY SKILL IN THE ART IS NOT SUFFICIENT BY ITSELF TO ESTABLISH *PRIMA FACIE* OBVIOUSNESS

A statement that modifications of the prior art to meet the claimed invention would have been “well within the ordinary skill of the art at the time the claimed invention was made” because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). See also *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1318 (Fed. Cir. 2000) (Court reversed obviousness rejection involving technologically simple concept because there was no finding as to the principle or specific understanding within the knowledge of a skilled artisan that would have motivated the skilled artisan to make the claimed invention); *Al-Site Corp. v. VSI Int’l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999) (The level of skill in the art cannot be relied upon to provide the suggestion to combine references.).

MPEP §2143.01, 4th heading

Because the claims of Group II recite specific unobvious structural sidewall features not suggested in the art, these claims are patentable independently of the claims of Group I.

The claims of Group III are believed patentable independently of Groups I and II because there is no motivation provided in the references for combining the *McChesney* reference (United States Patent No. 3,984,498) with *Willbrandt* ‘337. In particular, creep strain, the problem addressed by *McChesney* ‘498 is the long term permanent deformation of a plastic body. This is not a problem with disposable plastic cups such as disclosed by *Willbrandt* ‘337 or the present invention. Further, the impact resistance is surprising as is

seen in Table 6 of the application as filed where energy to fracture values of styrene/butadiene containing cups is almost 3 times higher than other cups of styrene alone:

Table 6 (Abbreviated). Comparison of K Resin/Polystyrene Tumbler

Sample	Volume	Cup Height	Weight	Pendulum		
				Failure Angle	Energy to break	Failure mode
	(oz)	(in)	(g)	(Degree)	(lbf-in)	
G*	16	4.88	17.50	20	5.6	60% cracks 40% pieces
H**	16	4.88	17.21	33.5	15.5	60% cracks 40% creases

*styrene

**styrene/styrene-butadiene

Note an energy to break of 15.5 versus 5.6 for styrene alone.

The surprising results render the subject matter of Group III patentable in any event for reasons further discussed in connection with the claims of Groups I and II below.

Even if a *prima facie* case of obviousness had been made in this application, with respect to any claim, the *Declaration* evidence and test data submitted render the claimed subject matter patentable. For example, the styrene-butadiene tumblers of Claims 77-82 are seen to be unexpectedly superior in Table 6 of the application. *So also*, the *Declaration of Erland R. Sandstrom* submitted in January, 2002, shows that the tumblers of the invention are superior in terms of lip feel and impact resistance and were unexpectedly amenable to manufacture by existing equipment. In this respect, paragraphs 12-16 of the *Declaration* are particularly pertinent:

12. There are at least three aspects to the claimed subject matter above which involve unexpected and, in my opinion, surprising, results. First, the cups of the invention were found to decrease "lip feel" negatives to a surprising degree over prior art injection blow-molded cups. Second, the cups of the

invention are surprisingly impact-resistant as compared with prior art injection blow-molded cups. Finally, the cups of the invention with a compact, solid brim, were unexpectedly suitable for the injection blow-molding process. The process is basically that described in United States Patent No. 4,540,543. The integrated injection blow-molding process is readily distinguished from other blow-molding techniques for making cups due to the requirement that the parison must be retained in place by its brim.

13. With respect to the data which follows, the cups tested were 16 oz. cups as shown generally in Figure 8 of the above-noted application. The cups of the invention tested had a 63 mil (0.063") beaded brim as shown in Figure 4B of the above-noted application and the other cups had a curled, "U" shaped rim as shown in Figure 4A of the above-noted application having a 125 mil wide brim and an 85 mil wide brim. The various geometric features are summarized in Figure 1:

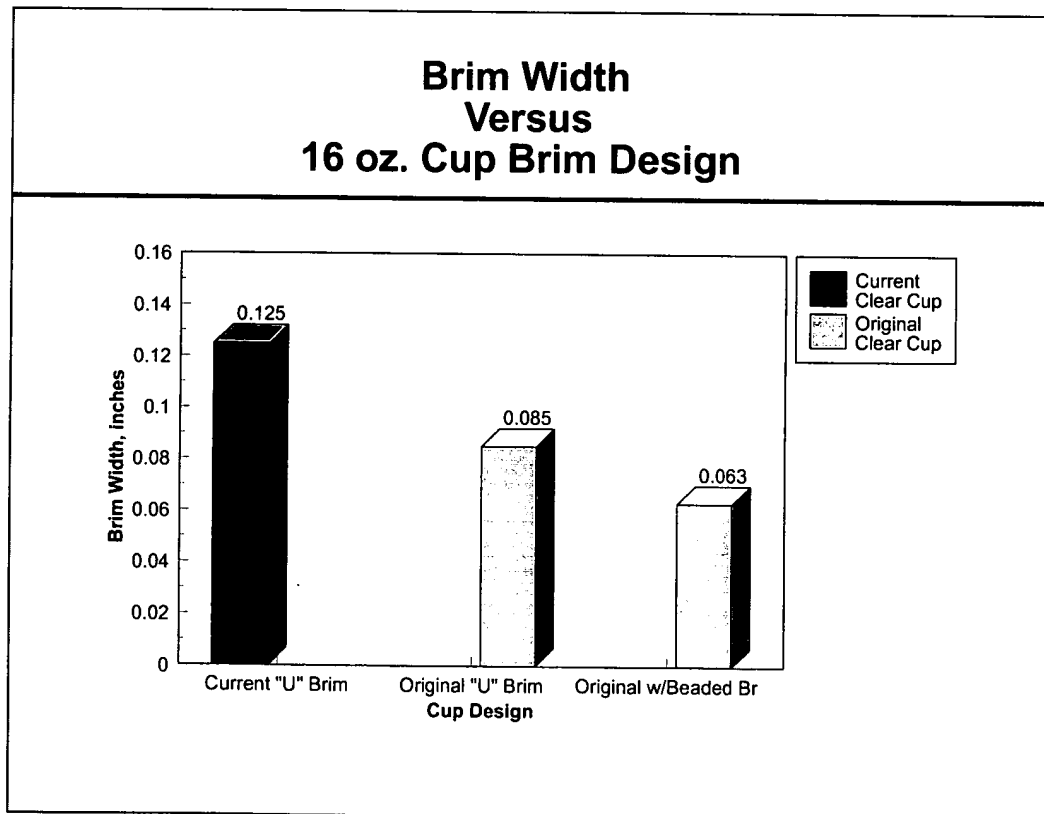


Figure 1

In Figure 1, as well as Figures 2 and 3 below, the cups of the invention are designated "Original w/Beaded Br". Cups with a 125 mil "U" shaped

brim are designated "Current "U" Brim" and cups with an 85 mil "U" shaped brim are designated "Original "U" Brim".

14. The cups were compared for "Lip Feel Negatives" using a non-directed panel. These evaluations were conducted by providing panelists with a cup of water and asking them to drink. Panelists were then asked to comment on anything they liked or disliked about the experience. A Lip Feel Negative was recorded when a panelist remarked that the brim felt uncomfortable or "sharp" on the lips. Oftentimes such remarks were the panelists' first comments, despite the fact that the panelists were not directed in any way to a feature of the cup.

Results appear in Figure 2 below:

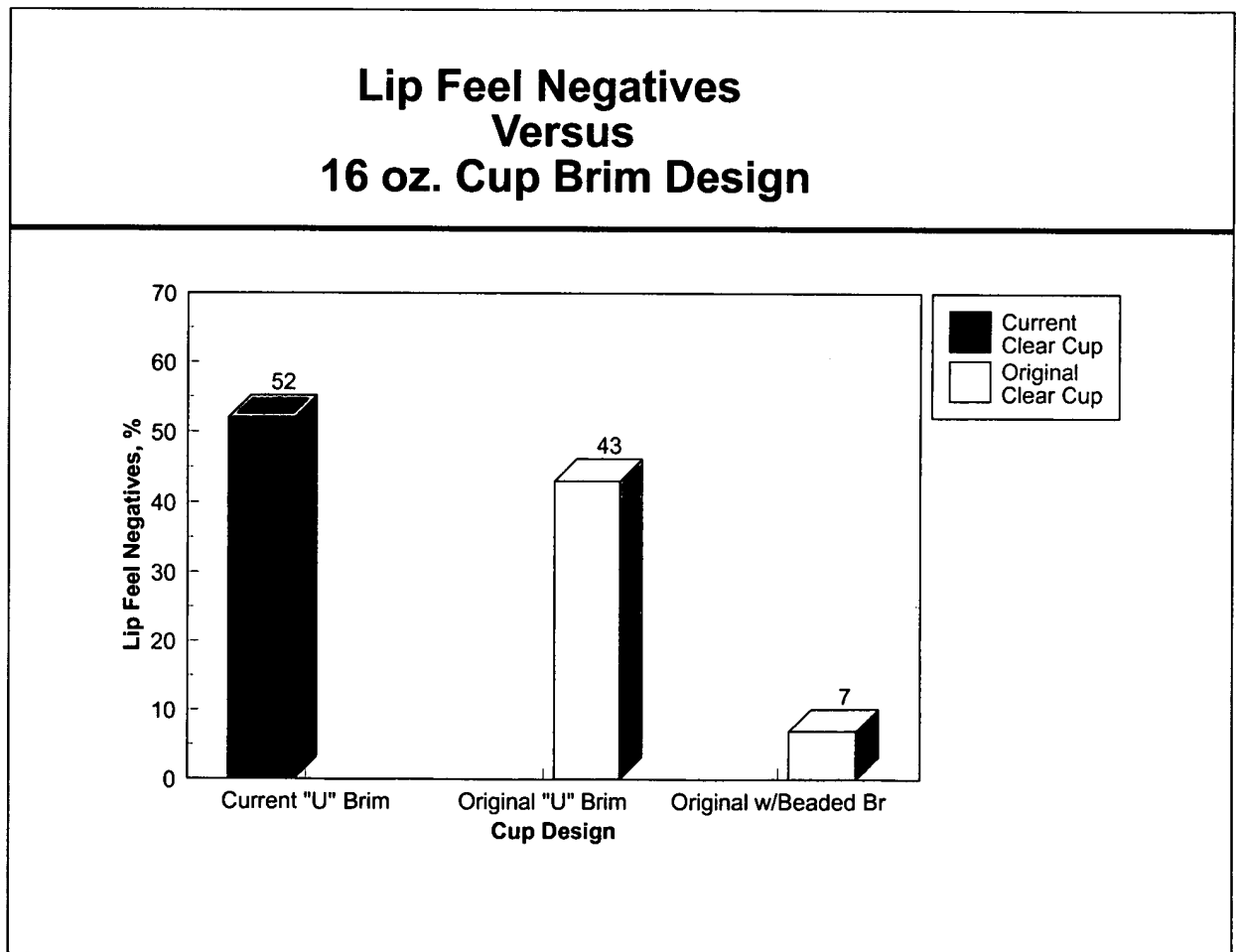


Figure 2

It can be seen in Figure 2 that the lip feel negatives were dramatically reduced by a factor of 6 or more. In my opinion, this is a surprising finding, one which is of significant commercial significance. Thermoformed cups typically have a fully rolled brim without edges, so that lip feel is less of an issue.

15. The cups were also compared for impact resistance using generally the procedure described in the above-noted patent application at pages 60-61. Results appear in Figure 3.

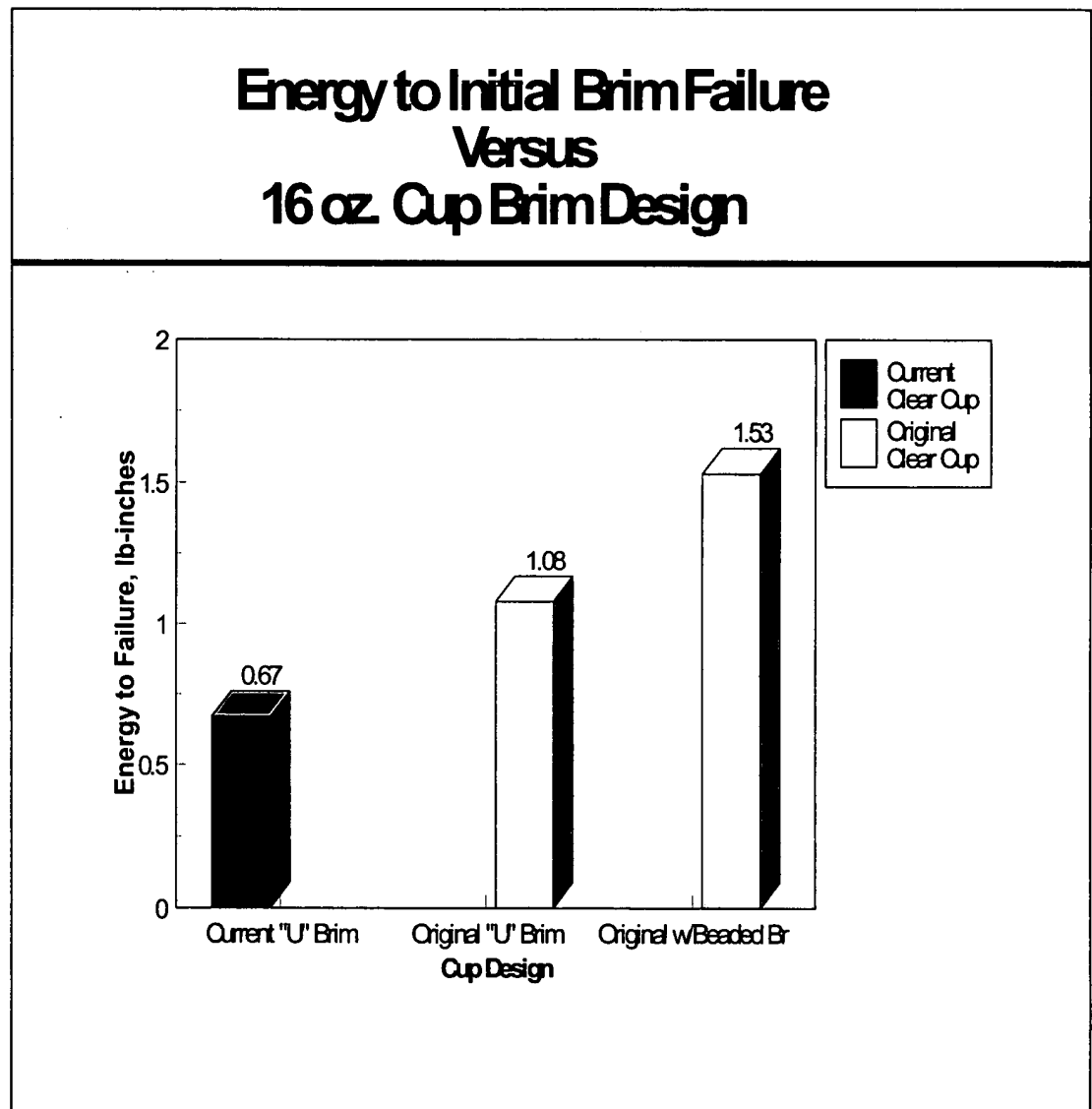


Figure 3

Here again, it is seen that the cups of the invention exhibited an unexpected and surprising increase in impact resistance; more than 100% increase in impact energy at failure versus cups with a 125 mil curled brim. This unexpected result was, in my opinion, surprising. Note also that these results are similar to those initially found and reported in Table 3 of the above-noted application.

16. Another unanticipated result found in connection with the above-noted invention was that the solid rim of much smaller size than prior art "U" shaped rims was sufficient to hold the product in place during the integrated injection blow-molding fabrication process, which is described generally in United States Patent No. 4,540,543. Conventional wisdom was that a "U" shaped curl on the product was necessary in order to hold the product in place during the fabrication process. In fact, engineers and operators of the process told me that a compact, rounded solid rim would not work in the process. In my opinion, the fact that the products of the invention can be made by way of the injection blow-molding without special equipment and without unwanted features to hold the parison in place is an unexpected and surprising aspect of the invention.

In re Soni, 34 USPQ2d 1684, 1687 and following (CAFC 1995), notes that uncontradicted Declaration evidence of unexpected results ordinarily suffices for purposes of nonobviousness:

Mere improvement in properties does not always suffice to show unexpected results. In our view, however, when an applicant demonstrates substantially improved results, as Soni did here, and states that the results were unexpected, this should suffice to establish unexpected results in the absence of evidence to the contrary. Soni, who owed the PTO a duty of candor, made such a showing here. The PTO has not provided any persuasive basis to question Soni's comparative data and assertion that the demonstrated results were unexpected. Thus, we are persuaded that the Board's finding that Soni did not establish unexpected results is clearly erroneous.

The cases cited by the dissent are not to the contrary. Neither *De Blauwe*, nor *Wood*, nor *Lindner* requires a showing of unexpectedness separate from a showing of significant differences in result. Nor does *Merck*, which involved compositions understood to differ only in "a matter of degree." Those are not the facts here, where substantially improved properties were shown. Given a presumption of similar properties for similar compositions, substantially improved properties are ipso facto unexpected. The difficulty postulated by the dissent in distinguishing substantial from insubstantial improvement is no greater than the PTO and the courts have encountered, successfully, for many years in making judgments on the question of obviousness. It is not unworkable; it is simply the stuff of adjudication. Nor does it change

established burdens of proof. The PTO here established a prima facie case, the applicant responded to it with a showing of data, and the PTO made an inadequate challenge to the adequacy of that showing.

All claims should be allowed.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Michael W. Ferrell". The signature is fluid and cursive, with the first name "Michael" and last name "Ferrell" clearly distinguishable.

Michael W. Ferrell
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May 25, 2004



APPENDIX A
CLAIMS ON APPEAL

1. An injection blow-molded tumbler formed from a polymeric material comprising:
 - (a) a base defining a base diameter forming the bottom of said tumbler, the base also defining an outer edge thereof;
 - (b) a sidewall integrally formed with said base extending upwardly from the outer edge thereof defining about its upper extremity an opening having a diameter generally larger than the base diameter provided with a fortified rim integrally formed with the sidewall in the form of a continuous solid polymer bead;

wherein said fortified rim has a thickness from about 1.5 to about 6 times the thickness of the adjacent portion of said sidewall and wherein the volume of the injection blow-molded tumbler is from about 1.5 to about 4 times the volume of an injection molded parison from which it was prepared, and wherein further the sidewall defines a substantially straight profile extending between the base and the upper opening defined thereby.

2. An injection blow-molded tumbler formed from a polymeric material comprising:
 - (a) a base defining a base diameter forming the bottom of said tumbler, the base also defining an outer edge thereof;
 - (b) a sidewall integrally formed with said base extending upwardly from the outer edge thereof having a thickness of from about 5 to about 50 mils defining about its upper extremity an opening having a diameter generally larger than the base diameter provided with a fortified rim integrally formed with the sidewall in the form of a continuous solid polymer bead;
 - (c) said sidewall extending upwardly with a taper of from about 1.0 to about 4.5 degrees, and

wherein said fortified rim has a thickness of from about 1.5 to about 6 times the thickness of the adjacent portion of said sidewall and wherein the volume of the injection blow-molded tumbler is from about 1.5 to about 4 times the volume of an injection molded parison from which it was prepared, and wherein further the sidewall defines a substantially straight profile extending between the base and the upper opening defined thereby.

3. The tumbler according to Claim 2, wherein said sidewall extends upwardly with a taper of from about 2.75 to about 4 degrees.
4. The tumbler according to Claim 3, wherein said sidewall extends upwardly with a taper of about 3 degrees.
6. The tumbler according to Claim 2, wherein said fortified rim has a thickness and height of from about 3 to about 5 times the thickness of the adjacent portion of said sidewall.
9. The tumbler, according to Claim 2, wherein said polymer is polystyrene.
10. An injection blow-molded tumbler formed from a polymeric material comprising:
 - (a) a base defining a base diameter forming the bottom of said tumbler, the base also defining an outer edge thereof;
 - (b) a sidewall integrally formed with said base extending upwardly from the outer edge thereof having a thickness of from about 5 to about 50 mils defining about its upper extremity an opening having a diameter generally longer than the base diameter provided with a fortified rim integrally formed with the sidewall in the form of a continuous solid polymer bead;
 - (c) the volume of said injection blow-molded tumbler being from about 1.5 to about 4 times the volume of an injection molded parison from which it was prepared;

wherein said fortified rim has a thickness of from about 1.5 to about 6 times the thickness of the adjacent portion of said sidewall and

wherein said tumbler has a taper from about 1.0 to about 4.5 degrees, and

(d) wherein further the sidewall is provided with a molded in design comprising a series of triangular ridges deeper in dimension than the wall caliper thus providing strength by way of corrugation and having a wall thickness the same as the rest of the tumbler, and the sidewall defines a substantially straight profile extending between the base and the upper opening defined thereby.

11. The tumbler according to Claim 10, wherein the volume of said tumbler is from about 1.75 to about 3 times the volume of the injection molded parison from which it was prepared.
12. The tumbler according to Claim 11, wherein the volume of the tumbler is about twice the volume of the injection molded parison from which it was prepared.
13. The tumbler according to Claim 10, wherein said sidewall has a thickness of from about 10 to about 35 mils.
14. The tumbler according to Claim 13, wherein the sidewall has a thickness of from about 15 to about 25 mils.
15. The tumbler according to Claim 14, wherein the sidewall has a thickness of about 20 mils.
16. An injection blow-molded tumbler formed of an optically clear polymer comprising:
 - (a) a substantially circular base portion defining a base diameter, the base portion also defining an outer edge;

- (b) substantially cylindrical sidewall extending upwardly from the outer edge of the base portion having a thickness of from about 5 to about 50 mils defining about its upper extremity an opening having a diameter generally larger than the base diameter provided with a fortified rim integrally formed with the sidewall in the form of a continuous solid polymer bead;

said sidewall extending upwardly with an angular taper with its central axis of from about 1.0 to about 4.5 degrees;

said fortified rim having a thickness of from about 1.5 to about 6 times the thickness of the adjacent portion of said sidewall;

said sidewall further including a pattern which alters the cylindrical character thereof over at least a portion of said sidewall which pattern is operative as a grip portion for a user and wherein the volume of the injection blow-molded tumbler is from about 1.5 to about 4 times the volume of an injection molded parison from which it was prepared, and the sidewall defines a substantially straight profile extending between the base and the upper opening defined thereby.

17. The tumbler according to Claim 16, wherein a ratio of the height of the tumbler to the inside diameter of the upper portion of the sidewall is from about 2 to about 4.
18. The tumbler according to Claim 17, wherein said ratio is about 3.
19. The tumbler according to Claim 16, wherein said tumbler has contained volume of from about 12 to about 15 ounces.
20. The tumbler according to Claim 16, wherein said tumbler defines an inner volume of about 14 ounces.
21. The tumbler according to Claim 16, wherein said tumbler has a height of from about 5.75 to about 6 inches.

22. An injection blow-molded tumbler formed of a polymeric material comprising:

- (a) a base defining a base diameter forming the bottom of said tumbler, the base also defining an outer edge thereof;
- (b) a sidewall integrally formed with said base extending upwardly from the outer edge having a thickness of from about 5 to about 50 mils defining about its upper extremity an opening having a diameter generally larger than the base diameter provided with a fortified rim integrally formed with the sidewall in the form of a continuous solid polymer bead;

said sidewall extending upwardly with a taper of from about 2.5 to about 10 degrees;

wherein said fortified rim has a thickness from about 1.5 to about 6 times the thickness of the adjacent portion of said sidewall; and

wherein the volume of the injection blow-molded tumbler is from about 1.5 to about 4 times the volume of an injection molded parison from which it was prepared, and wherein further the sidewall defines a substantially straight profile extending between the base and the upper opening defined thereby.

23. The tumbler according to Claim 22, wherein said sidewall extends upwardly with a taper of from about 4.5 to about 10 degrees.

24. The tumbler according to Claim 23, wherein said sidewall extends upwardly with a taper of from about 4.5 to about 7.5 degrees.

26. The tumbler according to Claim 22, wherein said fortified rim has a thickness and height of from about 3 to about 5 times the thickness of the adjacent portion of said sidewall.

29. The tumbler, according to Claim 22, wherein said polymer is polystyrene.

30. An injection blow-molded tumbler formed of an optically clear polymer comprising:

- (a) a base defining a base diameter forming the bottom of said tumbler, the base also defining an outer edge thereof;
- (b) a sidewall integrally formed with said base extending upwardly from the outer edge thereof having a thickness of from about 5 to about 50 mils defining about its upper extremity an opening having a diameter generally larger than the base diameter provided with a fortified rim integrally formed with the sidewall in the form of a continuous solid polymer bead;

the volume of said injection molded tumbler being from about 1.5 to about 4 times the volume of an injection molded parison from which it was prepared;

wherein said fortified rim has a thickness of from about 1.5 to about 6 times the thickness of the adjacent portion of said sidewall over a height of at least 2 mils; and

- (c) wherein further the sidewall is provided with a design comprised of wall embossments of at least as prominent as $\frac{1}{2}$ the caliper of the sidewall, and the sidewall defines a substantially straight profile extending between the base and the upper opening defined thereby.

31. The tumbler according to Claim 30 wherein the volume of said tumbler is from about 1.75 to about 3 times the volume of the injection molded parison from which it was prepared.

32. The tumbler according to Claim 31 wherein the volume of the tumbler is about twice the volume of the injection molded parison from which it was prepared.

33. The tumbler according to Claim 30 wherein said sidewall has a thickness of from about 10 to about 35 mils.

34. The tumbler according to Claim 33 wherein the sidewall has a thickness of from about 15 to about 25 mils.

35. The tumbler according to Claim 34 wherein the sidewall has a thickness of about 20 mils.

36. An injection blow-molded tumbler formed of an optically clear polymer comprising:

- (a) a substantially circular base portion defining a base diameter, the base portion also defining an outer edge;
- (b) a substantially cylindrical sidewall extending upwardly from the outer edge of the base portion having a thickness of from about 5 to about 50 mils defining about its upper extremity an opening having a diameter generally larger than the base diameter provided with a fortified rim integrally formed with the sidewall in the form of a continuous solid polymer bead;

said sidewall extending upwardly with an angular taper with its central axis of from about 4.5 to about 10 degrees;

said fortified rim having a thickness of from about 1.5 to about 6 times the thickness of the adjacent portion of said sidewall;

said sidewall further including a pattern which alters the cylindrical character thereof over at least a portion of said sidewall which pattern is operative as a grip portion for a user, and

- (c) wherein further the pattern comprises wall embossments at least as prominent as $\frac{1}{2}$ the caliper of the sidewall, and the sidewall defines a substantially straight profile extending between the base and the upper opening defined thereby.

37. The tumbler according to Claim 36 wherein a ratio of the height of the tumbler to the inside diameter of the upper portion of the sidewall is from about 1 to about 5.

38. The tumbler according to Claim 37 wherein said ratio is from about 1.3 to about 1.7.

39. The tumbler according to Claim 36 wherein the height of said tumbler is from about 4.6 to about 4.8 inches.
40. The tumbler according to Claim 36 wherein the volume defined by said tumbler is from about 12 to about 16 ounces.
41. The tumbler according to Claim 36 wherein the volume defined by said tumbler is about 15 fluid ounces.
42. An injection blow-molded tumbler formed of a polymeric material comprising:
- (a) a base defining a base diameter forming the bottom of said tumbler, the base also defining an outer edge thereof;
 - (b) a sidewall integrally formed with said base extending upwardly from the outer edge thereof having a thickness of from about 5 to about 50 mils defining about its upper extremity an opening having a diameter generally larger than the base diameter provided with a fortified rim integrally formed with the sidewall in the form of a continuous solid polymer bead;
- said sidewall extending upwardly with a taper of from about 1 to about 10 degrees;
- wherein said fortified rim has a thickness from about 1.5 to about 6 times the thickness of the adjacent portion of said sidewall, said tumbler defining a volume of at least about 16 fluid ounces wherein the volume of the injection blow-molded tumbler is from about 1.5 to about 4 times the volume of an injection molded parison from which it was prepared, and wherein further the sidewall defines a substantially straight profile extending between the base and the upper opening defined thereby.
43. The tumbler according to Claim 42, wherein said sidewall extends upwardly with a taper of from about 2.75 to about 9 degrees.

44. The tumbler according to Claim 43, wherein said sidewall extends upwardly with a taper of from about 5 to about 7 degrees.

46. The tumbler according to Claim 42, wherein said fortified rim has a thickness and height of from about 3 to about 5 times the thickness of the adjacent portion of said sidewall.

48. The tumbler according to Claim 42, wherein said optically clear polymer is selected from the group consisting of polystyrene, clarified polypropylene, polyesters, polycarbonates, polyacrylates and styrene acrylonitrile.

50. An injection blow-molded disposable tumbler of an optically clear polymer comprising:

(a) a base defining a base diameter forming the bottom of said tumbler, the base also defining an outer edge thereof;

(b) a sidewall integrally formed with said base extending upwardly from the outer edge having a thickness of from about 5 to about 50 mils defining about its upper extremity an opening having a diameter generally larger than the base diameter provided with a fortified rim integrally formed with the sidewall in the form of a continuous solid polymer bead;

the volume of said injection molded tumbler being from about 1.5 to about 4 times the volume of an injection molded parison from which it was prepared and said tumbler defining a volume of from about 16-20 fluid ounces;

wherein said fortified rim has a thickness from about 1.5 to about 6 times the thickness of the adjacent portion of said sidewall; and

wherein said tumbler has a taper from about 2.5 to about 10 degrees, and wherein further the sidewall defines a substantially straight profile extending between the base and the upper opening defined thereby.

77. The injection blow-molded tumbler according to Claim 1, formed from a polymeric material including a copolymer of styrene and butadiene.
78. The injection blow-molded tumbler according to Claim 77, wherein the amount of butadiene residue in said copolymer is from about 2 to about 40 percent by weight.
79. The injection blow-molded tumbler according to Claim 77, wherein the amount of butadiene residue in said copolymer is from about 15 to about 30 percent by weight.
80. The injection blow-molded tumbler according to Claim 77, wherein said tumbler consists essentially of styrene-butadiene copolymer blended with polystyrene.
81. The injection blow-molded tumbler according to Claim 77, wherein said polymeric material consists of a blend of polystyrene with a copolymer of styrene and butadiene.
82. The injection blow-molded tumbler according to Claim 1, including an impact modifier selected from the group consisting of core shell polymers, olefin containing copolymers, rubber polymers and copolymers, styrene containing copolymers, and mixtures thereof.
83. The injection blow-molded tumbler according to Claim 1, formed from a polymeric material including a mineral filler wherein said mineral filler is present in an amount of from about 5 to about 50 wt.%.
84. The injection blow-molded tumbler according to Claim 83, wherein said mineral filler is present in an amount of from about 8 to about 20 wt.%.
85. The injection blow-molded tumbler according to Claim 84, wherein said mineral filler is present in an amount of from about 10 to about 15 wt.%.

90. The injection blow-molded tumbler according to Claim 1, wherein the polymer bead forming the fortified rim has a curved profile.
91. The injection blow-molded tumbler according to Claim 90, wherein the polymer bead forming the fortified rim has a circular profile.



B1

3M Innovative Properties Co. v. Avery Dennison Corp., 69 USPQ2d 1050 (CA FC 2003)
69 USPQ2D 1050
3M Innovative Properties Co. v. Avery Dennison Corp.
CA FC
U.S. Court of Appeals Federal Circuit
No. 03-1203
December 2, 2003
12/2/2003

Headnotes

PATENTS

[1] Patent construction — Claims — Broad or narrow (§125.1303)

Patent construction — Claims — Process (§125.1309)

Claim for carrier web having “multiple embossed patterns” does not require that patterns be created sequentially, since claim's reference to “first” and “second” embossed patterns is common patent-law convention used to distinguish between repeated instances of element or limitation, and does not, without more, impose serial or temporal limitation on claim, since patentee clearly acted as its own lexicographer in specification, which requires only that “two or more embossed patterns” be “superimposed,” since use of “superimposed” in this definition of “multiple embossed” does not transform claim into product-by-process claim or limit its scope to serial method of manufacture, and since limitation to serial embossing in patent's method claim cannot be read into claim at issue; although specification recites serial application of two patterns, such recitation cannot be imported into claim as limitation, and specification

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also discloses option of creating multiple embossed patterns in single step.

[2] Patent construction — Claims — Broad or narrow (§125.1303)

Patent construction — Claims — Defining terms (§125.1305)

Broadening claim amendment made during prosecution of patent in suit supports conclusion that claim at issue, for carrier web having “multiple embossed patterns,” does not require patterns to be created sequentially, since original claim was expressly limited to “a multiple sequentially embossed web,” and fact that patentee broadened claim in response to indefiniteness rejection and dropped sequential limitation is entirely permissible, and since plain language of claim as issued must control.

[3] Patent construction — Prosecution history estoppel (§125.09)

Patent construction — Claims — Broad or narrow (§125.1303)

Arguments made by patentee in traversing anticipation and obviousness rejections did not impose sequential-embossment limitation on claim for carrier web having “multiple embossed patterns,” since patentee's reference to first pattern that “survives” embossing of second pattern does not constitute clear and unambiguous disavowal of claim scope, since figure referred to by patentee does not illustrate sequential embossing of patterns, and since examiner's statement that claim was “drafted in the product-by-process format” does not constitute clear and unmistakable surrender of claim scope, in that patentee

overcame rejection without any need to address format of claim; applicant's silence in response to examiner's characterization of claim does not reflect applicant's clear and unmistakable acquiescence to that characterization if claim is eventually allowed on grounds unrelated to examiner's un rebutted characterization.

[4] Patent construction — Claims — Broad or narrow (§125.1303)

Patent construction — Claims — Defining terms (§125.1305)

Patent construction — Claims — Process (§125.1309)

Claim for carrier web having "multiple embossed patterns" does not include limitation related to process by which embossed surface is made, since patentee expressly acted as its own lexicographer by providing definition of "embossed" in specification, and such definition therefore controls meaning of term regardless of any potential conflict with term's ordinary meaning as derived from technical dictionaries, since definition in specification is entirely structural, and since patent therefore does not limit how embossed pattern, as defined in specification, is created.

Particular Patents

Particular patents — General and mechanical — Carrier webs

5,897,930, Calhoun and Koskenmaki, multiple embossed webs, summary judgment of noninfringement vacated.

Case History and Disposition

Appeal from the U.S. District Court for the District of Minnesota, Doty, S.J.

Action by 3M Innovative Properties Co. and Minnesota Mining & Manufacturing Co. against Avery Dennison Corp. for patent infringement. Plaintiffs appeal from summary judgment of noninfringement. Reversed in part, vacated in part, and remanded; Michel, J., dissenting in separate opinion.

Attorneys:

Frank P. Porcelli, Frank E. Scherkenbach, Robert E. Hillman, and Gregory A. Madera, and Kurt L. Glitzenstein, of Fish & Richardson, Boston, Mass.; John C. Adkisson, of Fish & Richardson, Minneapolis, Minn.; Kevin H. Rhodes, of 3M Innovative Properties Co., St. Paul, Minn., for plaintiffs-appellants.

Roderick G. Dorman, Lawrence M. Hadley, and Armand F. Ayazi, of Hennigan, Bennett & Dorman, Los Angeles, Calif.; Jay R. Campbell, of Renner Otto Boisselle & Sklar, Cleveland, Ohio, for defendant-appellee.

Judge:

Before Michel, Clevenger, and Linn, circuit judges.

Opinion Text

Opinion By:

Clevenger, J.

Plaintiffs-Appellants 3M Innovative Properties Company and Minnesota Mining and Manufacturing Company (collectively "3M") sued Defendant-Appellee Avery Dennison ("Avery") for infringement of claim 1 of U.S.

summary judgment in favor of Avery, concluding that Avery did not infringe, as a matter of law, the '930 patent either literally or under the doctrine of equivalents. We reverse the district court's claim construction, vacate its summary judgment and remand for further proceedings not inconsistent with this opinion.

I

3M and Avery compete in the market for adhesive-based products for the commercial graphics industry. In our increasingly image-suffused world, this industry seems to have targeted all available surfaces in public places, including the exterior of busses, trucks and other vehicles, as appropriate locations for advertising images. So that these advertisements may be efficiently and pervasively placed on such diverse surfaces, images are pre-printed onto sheets of adhesive-backed film. These films, like bumper stickers, have release liners that can be stripped off to reveal a pressure sensitive adhesive just prior to affixation of the image.

Even one of skill in the art of sticking films on surfaces can experience difficulties. Correct positioning of a large image may require repeated adjustments, and if the film is not initially placed in precisely the desired position, removing the film and repositioning it is likely to damage the film and mar the sought-after image. Additionally, pockets of air, in the form of bubbles or blisters, may become entrapped between the film and the surface if the two are not mated perfectly.

The '930 patent describes a release liner that, according to 3M, avoids these positioning and air-entrapment difficulties. Also according to 3M, Avery's EZ Film liner infringes the claims of the '930 patent in the features it uses to provide these benefits.

II

As implicated in the current litigation, the '930 patent "relates to embossed webs useful as liners for pressure sensitive adhesives." '930 patent, col. 1, ll. 5-7. When used as a "release liner," the "embossed web" is the adhesive-protective layer that is removed from the back of the film to expose the adhesive. More specifically, the '930 patent addresses embossed webs that are manufactured with a particular type of three-dimensional configuration or "topography" that are useful insofar as they fashion an obverse topography in the exposed adhesive.

Only independent product claim 1 of the '930 patent is at issue in this appeal, and it reads as follows:

1. A carrier web, comprising: at least one surface that has a multiple embossed pattern having a first embossed pattern and a second embossed pattern, wherein the first embossed pattern forms an array of depressions, wherein the depressions of the first embossed pattern are in the second embossed pattern, wherein the second embossed pattern comprises lands and ridges between the lands, and wherein the height of the ridges over the lands ranges from about 3 to about 45 mm. (emphasis added).

In the preferred embodiment, the first and second embossed patterns each serves a different function. The "depressions" of the first embossed pattern in the web enhance the film's positionability. They result in protruding bumps in the exposed adhesive, minimizing the surface area of the initial points of contact between the adhesive and the substrate and increasing the ease with which the image-imprinted film can be positioned after initial contact but before complete adhesion. Additionally, if nonadhesive granules, such as glass beads, are placed in the depressions prior to the web being coated with adhesive, the granules stick to the adhesive when the liner is removed, creating

nonadhesive bumps and further increasing positionability. In contrast, the "ridges" in between the "lands" of the second embossed pattern in the web result in a network of valleys in the exposed adhesive. Because these valleys create channels through which air can flow even after the film has adhered to the substrate, air that would otherwise become trapped as air bubbles due to imperfect application of the film can escape.

Independent method claim 6 is also relevant to this appeal, although 3M does not allege that Avery has infringed it. Claim 6 provides:

A method of embossing, comprising the steps of:

(a) embossing a carrier web having at least one surface with a first pattern, to create a first pattern of depressions;

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(b) embossing the surface with a second pattern, to create a second pattern of depressions comprising lands and ridges;

wherein the depressions created from the first embossing step are substantially preserved during the second embossing step even though the second embossing step superimposes the second pattern on the depressions created by the first embossing step, and wherein the height of the ridges over the land ranges from about 3 to about 45 mm.

The specification provides several definitions for terms used in claim 1, two of which are relevant here:

"Embossed" means a topography on a web or on tooling having an effective three-dimensional pattern that generates a difference in surface planar dimension in the liner or the tooling.

* * *

"Multiple embossed" means two or more embossing patterns are superimposed on the web to create a complex pattern of differing depths of embossing. '930 patent, col. 1, ll. 61-64, col. 2, ll. 1-3.

III

Avery's accused product is its EZ Film, an adhesive-backed graphics film with both positionability and air-egress features. The EZ Film liner is created by first depositing or printing polyurethane "ink" dots (the "PU dots") on top of the liner's outer polyethylene layer (the "PE layer") and then embossing a pattern of hexagonal ridges and lands in the liner when the PU/PE combination passes over an embossing roll. This hexagonal pattern in the liner creates air-egress-enabling channels in the adhesive layer when the liner is removed. At some point (or points) in the manufacturing process, the PU dots are pressed into the PE layer of the liner.¹ When the liner is removed from the adhesive layer, the PU dots remain affixed to the adhesive, creating less-adhesive, positionability-enhancing bumps.

IV

3M alleges that the Avery EZ Film liner infringes the '930 patent because the dents in the PE layer of the liner (created when the PU dots are embedded) constitute a "first embossed pattern," the hexagonal pattern constitutes a "second embossed pattern," and because all remaining claim limitations are satisfied.

In its first order, the district court construed claim 1 of the '930 patent and denied 3M's plea for a preliminary injunction on the ground, among other things, that 3M had not demonstrated a likelihood of success on the merits of its infringement claim. See *3M Innovative Props. Co. v. Avery Dennison Corp.*, 185 F.Supp.2d 1031, 1037-41 (D. Minn. 2002) ("3M I"). In a second order ruling on Avery's motion for summary judgment of noninfringement, the district court adopted the claim construction from 3M I, see *3M Innovative Props. Co. v. Avery Dennison Corp.*, No. Civ.01-1781 (DSD/FLN), 2002 WL 31628395, at *3 & n.2 (D. Minn. Oct. 19, 2002) ("3M II"), and granted Avery's motion, *id.* at *7.

In 3M I, the district court construed two terms from claim 1. First, construing the term "multiple embossed pattern," the district court held that "[w]hile the language of the claim does not mention the word 'sequential,' it nevertheless illustrates that the term 'multiple embossed pattern' requires sequential embossments." 185 F.Supp.2d at 1038. To arrive at this conclusion, the district court relied on its view of the plain meaning of "first" and "second" and characterized the definition of "multiple embossed" in the specification as evidence of the claim's product-by-process nature. *Id.* at 1038-39. Second, the court relied on the specification's express definition of the term "embossed," as well as a source that the district court treated as a technical dictionary,² to

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construe it to mean "a topography created on material by impressing a corresponding inverse topography on its surface." *Id.* at 1040-41.

In 3M II, the district court concluded that the Avery EZ Film liner did not, as a matter of law, literally infringe claim 1 because the accused product was manufactured using an "embedding" process and the product resulting from such an embedding process was not "embossed" as per the definition given to that term during claim construction. 3M II, 2002 WL 31628395, at *4. Moreover, the PU dots printed onto the liner were softened during the embedding process, so the PE layer of the liner was "not the inverse topography of the hardened PU ink dot earlier flexographically printed on the liner." *Id.* at *5. The district court also concluded that the Avery EZ Film liner did not, as a matter of law, infringe under the doctrine of equivalents because "[t]he doctrine of equivalents cannot be employed in a manner that vitiates a claim limitation," *id.* at *6 (citing *Scimed Life Sys., Inc. v. Advanced Cardiovascular Sys.*, 242 F.3d 1337, 1347 [58 USPQ2d 1059] (Fed. Cir. 2001); *K-2 Corp. v. Salomon S.A.*, 191 F.3d 1356, 1367 [52 USPQ2d 1001] (Fed. Cir. 1999)), and Avery had removed "one of the steps of the '930 patent—the 'first embossed pattern' forming an array of depressions," *id.*

V

In entering a summary judgment of noninfringement, the district court resolved both steps of the infringement inquiry as a matter of law; on appeal, we therefore review both *de novo*: (1) the scope of the patent claims and (2) the lack of a genuine issue of material fact in the conclusion that the device does not contain all of the limitations, either literally or by equivalents, that are present in the claims. See *Karlin Tech., Inc. v. Surgical Dynamics, Inc.*, 177 F.3d 968, 970-71, 974 [50 USPQ2d 1465] (Fed. Cir. 1999). In a case such as this one, however, where the district court's claim construction is reversed and a new one is given, we frequently remand for the district court to reconsider the

components of the second step—namely, whether a genuine issue of material fact exists and whether either party is entitled to summary judgment—using the new claim construction. See, e.g., *Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1338 [60 USPQ2d 1851] (Fed. Cir. 2001).

Claim construction begins with the language of the claims. See *Johnson Worldwide Assocs., Inc. v. Zebco Corp.*, 175 F.3d 985, 989 [50 USPQ2d 1607] (Fed. Cir. 1999). In construing patent claims, there is “a ‘heavy presumption’ that a claim term carries its ordinary and customary meaning,” *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 [62 USPQ2d 1658] (Fed. Cir. 2002) (quoting *Johnson Worldwide Assocs.*, 175 F.3d at 989), namely its meaning “amongst artisans of ordinary skill in the relevant art at the time of the invention,” *ResQNet.com, Inc. v. Lansa, Inc.*, 347 F.3d 1347, 1378 [68 USPQ2d 1619] (Fed. Cir. 2003) (citing *Rexnord*, 274 F.3d at 1342). “[D]ictionaries and treatises may also assist the courts.” *Id.* (citing *Tex. Digital Sys., Inc. v. Telegenix, Inc.*, 308 F.3d 1193, 1202-03 [64 USPQ2d 1812] (Fed. Cir. 2002)); see also *Vitronics Corp. v. Conceptor, Inc.*, 90 F.3d 1576, 1584 n.6 [39 USPQ2d 1573] (Fed. Cir. 1996) (noting that “[j]udges ... may ... rely on dictionary definitions” to construe claim terms).

A term’s ordinary meaning, however, must be considered in the context of all intrinsic evidence, namely the claims, the specification, and the prosecution history. See *Rexnord*, 274 F.3d at 1342-43 (explaining that claim terms must be examined in light of the specification and the prosecution history); cf. *Gart v. Logitech, Inc.*, 254 F.3d 1334, 1339-40 [59 USPQ2d 1290] (Fed. Cir. 2001) (defining intrinsic evidence). While limitations in the specification must not be routinely imported into the claims because a patentee need not describe all embodiments of his invention, see *Rexnord*, 274 F.3d at 1344, a definition of a claim term in the specification will prevail over a term’s ordinary meaning if the patentee has acted as his own lexicographer and clearly set forth a different definition, see *Tex. Digital Sys.*, 308 F.3d at 1204 (noting that “the inconsistent dictionary definition must be rejected” if the specification rebuts the presumption of ordinary and customary meaning); *Rexnord*, 274 F.3d at 1342. “This court also considers the prosecution history ... to determine whether the applicant clearly and unambiguously ‘disclaimed or disavowed [any interpretation] during prosecution in order to obtain claim allowance.’” *Middleton, Inc. v. Minn. Mining*

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&Mfg. Co., 311 F.3d 1384, 1388 [65 USPQ2d 1138] (Fed. Cir. 2002) (quoting *Standard Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 452 [227 USPQ 293] (Fed. Cir. 1985)) (alteration in original); see also *Omega Eng’g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1324 [67 USPQ2d 1321] (Fed. Cir. 2003) (noting that “the doctrine of prosecution disclaimer” does not apply “where the alleged disavowal of claim scope is ambiguous”).

A

[1] The district court erred when it defined the term “multiple embossed patterns” to include a limitation that the patterns be created sequentially. The use of the terms “first” and “second” is a common patent-law convention to distinguish between repeated instances of an element or limitation. See, e.g., *Anchor Wall Sys., Inc. v. Rockwood Retaining Walls, Inc.*, 340 F.3d 1298, 1304 [67 USPQ2d 1865] (Fed. Cir. 2003) (“first

and second sidewall surfaces”); *Springs Window Fashions LP v. Novo Indus., L.P.*, 323 F.3d 989, 992 [65 USPQ2d 1826] (Fed. Cir. 2003) (“first and second opposed ends”). In the context of claim 1, the use of the terms “first ... pattern” and “second ... pattern” is equivalent to a reference to “pattern A” and “pattern B,” and should not in and of itself impose a serial or temporal limitation onto claim 1.

In the specification, 3M clearly acted as its own lexicographer, and the definition provided requires only that the “two or more embossing patterns” be “superimposed.” ’930 patent, col. 2, ll. 1-2. Despite Avery’s arguments to the contrary, the use of “superimposed” in this definition neither transforms claim 1 into a product-by-process claim nor even limits the scope of the claim to a serial method of manufacture; it describes only the structural relationship between the embossing patterns. See Webster’s Third New International Dictionary 2294 (1993) (defining “superimposed” as “layered”). Furthermore, even words of limitation that can connote with equal force a structural characteristic of the product or a process of manufacture are commonly and by default interpreted in their structural sense, unless the patentee has demonstrated otherwise. See *Hanzai v. United States Int’l Trade Comm’n*, 126 F.3d 1473, 1479 [44 USPQ2d 1358] (Fed. Cir. 1997) (concluding that “chemically engraved” was not a process term); *Vanguard Prods. Co. v. Parker Hannifin Corp.*, 234 F.3d 1370, 1372 [57 USPQ2d 1087] (Fed. Cir. 2000) (holding that the claim term “integral” describes a structural relation, not the particular manufacturing process related in the specification); cf. *id.* (“A novel product that meets the criteria of patentability is not limited to the process by which it was made.” (citing 3 Donald S. Chisum, *Chisum on Patents* § 8.05, at 8-79 (2000))). Nothing in the intrinsic evidence of the patent requires that a limitation of sequential creation of the “multiple embossed pattern” should be included in claim 1. The limitation of serial embossing clearly present in method claim 6 cannot be read into claim 1; furthermore, method claim 6 creates new terms—“the first embossing step” and “the second embossing step”—to carry the serial-embossing limitation. It is true that language in the specification of the ’930 patent recurrently recites serial application of the two patterns. See, e.g., ’930 patent, col. 3, ll. 16-17 (“An advantage of the present invention is to create a means of sequential manufacturing of articles using different depths of depressions and same or different materials.”); *id.*, col. 6, ll. 66-67 (“Because the multiple embossings of the web occur sequentially ...”). Limitations from the specification, however, cannot be imported into the claims, and this rule must be strictly enforced in light of the clear definition of “multiple embossed” provided in the specification—a definition devoid of sequential limitation. Furthermore, the specification also discloses the option, albeit not the preferred option, of creating multiple embossed patterns in a single step. See *id.*, col. 2, ll. 11-15 (“Although the multiple embossing steps could be combined into a single step with the design of a suitable tool or mold, the advantage of multiple steps is that the depressions formed by the prior step(s) can be filled with material prior to the subsequent embossing step(s).”).

[2] A broadening claim amendment made during the prosecution history of the ’930 patent supports a plain-meaning construction of claim 1 without a sequential-embossment limitation. As filed in the original patent application, claim 1 was expressly limited to a “multiple sequentially embossed” web.³ In response

to the examiner's § 112, ¶ 2 indefiniteness rejection, 3M amended claim 1 to claim a carrier web "that has a multiple embossed pattern having a first embossed pattern and a second embossed pattern," referring to definitions of "multiple embossed" and "embossed" that were in the specification at the time of the original patent application. The fact that 3M broadened its claims in response to an indefiniteness rejection and dropped the sequential limitation is perhaps unusual, but it is entirely permissible, and the plain language of the claim as issued must control. Cf. *Smith v. Snow*, 294 U.S. 1, 16 (1935) ("It is of no moment that in the course of the proceedings in the Patent Office the rejection of narrow claims was followed by the allowance of the broader claim 1."); *United States v. Teletronics, Inc.*, 857 F.2d 778, 782-83 [8 USPQ2d 1217] (Fed Cir. 1988) (concluding that adding a limitation to a claim during prosecution and then removing it when the limitation failed to result in allowance of the claim over the prior art does not permit reading of limitation into claim when the claim issued without it). Avery also argues that claim 1 contains a sequential-embossment limitation because of the arguments that 3M made during prosecution to overcome section 102(b) anticipation and section 103(a) obviousness rejections by the examiner. To traverse an anticipation rejection of both product claim 1 and method claim 8 (which eventually issued as method claim 6) based on references that taught that "two or more adhesives having different properties may be coated into the same recesses" on the web, 3M stated that:

Applicants here are claiming two different embossed patterns where the first embossed pattern survives the embossing of the second pattern. See Fig. 2, for an illustration of this patentable point. In [the prior art reference], there is only one embossed pattern, that can be filled with the same or different adhesives. There are not two embossed patterns as Applicants require in Claims 1 and 8.

The examiner withdrew his objection in response to 3M's argument.4

[3] Avery argues that 3M thus expressly disclaimed any patent scope beyond sequential embossment of patterns when it used language pregnant with temporal implications—the first pattern "survives" the embossing of the second—to traverse the examiner's rejections. 3M's use of the term "survives" in the prosecution history, however, does not constitute the clear and unambiguous disavowal of claim scope that is required to read a limitation into an expressly defined term. See *Middleton*, 311 F.3d at 1388. To distinguish the prior art in question, 3M needed only to argue, as it did in the last two sentences of the quotation above, that the '930 patent claimed "two embossed patterns" rather than "one embossed pattern." When the patentee has expressly defined a term in the specification and remarks made to distinguish claims from the prior art are broader than necessary to distinguish the prior art, the full breadth of the remark is not "a clear and unambiguous disavowal of claim scope as required to depart from the meaning of the term provided in the written description." *Storage Tech. Corp. v. Cisco Sys., Inc.*, 329 F.3d 823, 833 [66 USPQ2d 1545] (Fed. Cir. 2003). Furthermore, Figure 2 of the '930 patent, to which 3M directed the examiner, illustrates only the coexistence of two distinct patterns in the final product, not the sequential embossing of the patterns.

Finally, in explaining a subsequent anticipation rejection under section 102(b) on the basis of other prior art, the examiner stated that claim 1 was “drafted in the product-by-process format.” 3M never responded to this statement during the remainder of the prosecution because the objection was overcome without any need to address whether claim 1 was or was not a product-by-process claim. In this context, the examiner’s statement does not constitute a clear and unmistakable surrender of claim scope. See *Middleton*, 311 F.3d at 1388. “[P]rosecution history ... cannot be used to limit the scope of a claim unless the applicant took a position before the PTO.” *Schwing GmbH v. Putzmeister Aktiengesellschaft*, 305 F.3d 1318, 1324-25 [64 USPQ2d 1641] (Fed. Cir. 2002) (emphasis added). An applicant’s

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silence in response to an examiner’s characterization of a claim does not reflect the applicant’s clear and unmistakable acquiescence to that characterization if the claim is eventually allowed on grounds unrelated to the examiner’s un rebutted characterization.
B

[4] The district court also erred when it defined the term “embossed” by imposing a limitation related to the process by which the embossed surface is made. See 3M I, 185 F.Supp.2d at 1040-41 (defining embossed as “a topography created on material by impressing a corresponding inverse topography on its surface”). Because 3M expressly acted as its own lexicographer by providing a definition of embossed in the specification, the definition in the specification controls the meaning of embossed, regardless of any potential conflict with the term’s ordinary meaning as reflected in technical dictionaries. See *Tex. Digital Sys.*, 308 F.3d at 1204; *Rexnord*, 274 F.3d at 1342.

The specification expressly states that “[e]mbossed” means a topography on a web or on tooling having an effective three-dimensional pattern that generates a difference in surface planar dimension in the liner or the tooling.” ’930 patent, col. 1, ll. 61-64. This definition defines “embossed” materials to include both the web and the tooling (a device that can be used to impress a pattern into a web), provided each has a “topography” that has “an effective three-dimensional pattern that generates a difference in surface planar dimension.” 5 This definition is entirely structural. 3M defines an “embossed” material as one that has particular surface characteristics: a “topography” with an “effective three-dimensional pattern,” the pattern creating “a difference in surface planar dimension.” The district court erred when it introduced a process limitation of embossed by requiring the topography to be created by impression of a corresponding inverse topography. The patent does not limit how the embossed pattern, as defined in the specification, is created.

VI

Because the district court erred in its claim construction, the reasoning underpinning its grant of summary judgment of noninfringement to Avery is no longer relevant. We do not reach the question of infringement under its now-vacated claim construction. Furthermore, because the parties have not briefed infringement under our claim construction, and because we cannot determine whether sufficient discovery has occurred to rule on infringement-related summary judgment motions using this court’s claim

construction, we remand to the district court for further proceedings not inconsistent with this opinion.

COSTS

No costs.

REVERSED-IN-PART, VACATED-IN-PART AND REMANDED

Footnotes

1 Avery alleges that, during the manufacture of its EZ Film liner, the PU dots are imbedded only at the embossing roll, the same point in the process at which the hexagonal pattern is created. The district court noted that “3M present[ed] expert testimony to support its contention that embossing occurs at the squeegee roll,” a point in the process earlier than the embossing roll, but it concluded that “that testimony does not create a genuine issue of material fact.” See 3M Innovative Props. Co. v. Avery Dennison Corp., No. Civ.01-1781 (DSD/FLN), 2002 WL 31628395, at *5 n.5 (D. Minn. Oct. 19, 2002). Because we reverse the district court’s claim construction, we need not review the district court’s conclusion that no genuine issue of material fact existed.

2 “The TAPPI 1993-1994 Technical Information Sheets define ‘embossing’ as ‘creating a finish or design imparted by compressing a material between matched rigid surfaces or rigid and ductile surface having the desired raised or depressed surface pattern.’” 3M I, 185 F.Supp.2d at 1041.

3 As initially filed, claim 1 read: “A carrier web, comprising: at least one surface that is multiple, sequentially embossed with a pattern, wherein depressions created from the prior embossing pattern(s) are substantially preserved during the subsequent embossing pattern(s) even though the subsequent embossing pattern(s) are superimposed on the depressions from the prior embossing patterns(s).”

4 3M made similar arguments to traverse another anticipation and an obviousness rejection as well.

5 If the district court’s definition were correct, then the definition provided in the specification (which of course cannot be ignored) would create a problem of infinite recursion: the tooling itself would have to be created “by impressing a corresponding inverse topography on [the tooling’s] surface”; the “corresponding inverse topography” that creates the tooling, itself a meta-tooling, would have to be created “by impressing a corresponding inverse topography on [the meta-tooling’s] surface,” etc. At oral argument, Avery argued that the definition in the specification must be ignored because it is nonsensical. Cf. CCS Fitness, 288 F.3d at 1367 (noting that a claim term will not be given its ordinary meaning if the term deprives the claim of all clarity). The only interpretation under which the definition of embossed provided in the specification is nonsensical is Avery’s.

Dissenting Opinion Text

Dissent By:

Michel, J., dissenting.

I respectfully dissent, because I disagree with the majority’s construction of claim 1 as a pure product claim. The majority’s construction runs counter to the definition of claim terms chosen by the patentee as well as the analyses of the district court and the patent examiner, both of whom expressly interpreted claim 1 as a product-by-process claim. The

majority incorrectly reads the definition of “multiple embossed” as purely structural, when in my view it requires process. Moreover, the majority’s claim construction may weaken the notice function of this claim: I believe a reasonable competitor would read claim 1 as a product claim with a process limitation.

Claim 1 reads as follows:

1. A carrier web, comprising:

at least one surface that has a multiple embossed pattern having a first embossed pattern and a second embossed pattern, wherein the first embossed pattern forms

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an array of depressions, wherein the depressions of the first embossed pattern are in the second embossed pattern, wherein the second embossed pattern comprises lands and ridges between the lands, and wherein the height of the ridges over the lands ranges from about 3 to about 45 mm. '930 patent, col. 9, ll. 32-41 (emphasis added). Defendant argues that the use of the claim term “multiple embossed pattern” requires that the carrier web have undergone embossing, in much the same way that a claim term “welded joint” would mean a joint that results from the process of welding. (Red Br. at 28.) Defendant further contends that the required embossing must be sequential, i.e., multiple embossing tools sequentially emboss different patterns onto the carrier web. Although the district court accepted both of these arguments, the majority now rejects both.

The written description states:

“Embossed” means a topography on a web or on tooling having an effective three-dimensional pattern that generates a difference in surface planar dimension in the liner or the tooling.

...

“Multiple embossed” means two or more embossing patterns are superimposed on the web to create a complex pattern of differing depths of embossing. '930 patent, col. 1, ll. 61-64, col. 2, ll. 1-3. The majority interprets the definition of “multiple embossed” as “neither transform[ing] claim 1 into a product-by-process claim nor even limit[ing] the scope of the claim to a serial method of manufacture; it describes only the structural relationship between the embossing patterns.” (Maj. Op. at 9.) The majority interprets the definition of “embossed” to be “entirely structural.” (Id. at 14.) Based on its interpretations of the two definitions — and its correct conclusion that the patentee nowhere clearly disavowed these definitions — the majority construes claim 1 as purely structural.

I do not think the definition of “multiple embossed” describes only the structural relationship between the embossing patterns. To the contrary, the definition expressly requires that an action have taken place: “[m]ultiple embossed” means two or more embossing patterns are superimposed on the web to create a complex pattern of differing depths of embossing.” '930 patent, col. 2, ll. 1-3 (emphasis added). The highlighted text is a verb clause — “are superimposed ... to create” — and its inclusion in the definition must be recognized as meaningful.

Having concluded that the definition of “multiple embossed” requires process, the next issue is what is the meaning of the definitional language “two or more embossing patterns are superimposed on the web to create ...” Here, I turn to the written description’s

definition of “embossed”: “a topography on a web or on tooling having an effective three-dimensional pattern that generates a difference in surface planar dimension in the liner or the tooling.” ’930 patent, col. 1, ll. 61-64 (emphasis added). Applying this definition, I conclude that the “two or more embossing patterns superimposed on the web” result from two or more topographies, each on a web or on tooling. In the context of embossing of a liner, the relevant topographies initially are only on tooling — that is, the liner is embossed by tools. Thus, I interpret the process in the definition of “multiple embossed” as the superimposition of two or more topographies —each on a tool — onto the web. This process is incorporated as a limitation into claim 1 through the claim’s use of the term “multiple embossed.”

Unlike the district court, however, I do not view claim 1’s process limitation as necessarily sequential. Nothing in the definition of “multiple embossed” compels the conclusion that the tools are applied to the web serially, as opposed to simultaneously. Moreover, I agree with the majority that the prosecution history and the remainder of the written description do not contain a clear disavowal of a simultaneous application of the embossing tools. Indeed, although a sequential process is repeatedly discussed, one sentence of the written description clearly contemplates a simultaneous process. ’930 patent, col. 2, ll. 11-12 (“Although the multiple embossing steps could be combined into a single step ...”). I therefore do not construe the term “multiple embossed” in claim 1 as requiring the sequential application of embossing tools.

Nevertheless, because the accused product’s pattern results from only one embossing tool, it is not “multiple embossed.” As it therefore cannot infringe, I would affirm the summary judgment of non-infringement, even though several of the district court’s constructions

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—including the sequential requirement — were incorrect. The judgment may stand regardless of these errors, because under the correct claim construction infringement by defendant’s product cannot be shown.

- End of Case -
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C1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Erland R. Sandstrom et al.

U.S. Serial No. 09/437,554

Filed: November 10, 1999

Docket No. 2160 (FJ-99-36)

For: INJECTION BLOW-MOLDED
DISPOSABLE TUMBLER AND
METHOD OF MAKING SAME

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Examiner: M. Patterson

Group Art Unit: 1772

DECLARATION OF ERLAND R. SANDSTROM

Sir:

Erland R. Sandstrom, a co-inventor in the above-noted patent application, hereby declares that:

1. He was awarded a Bachelor's Degree in Chemical Engineering more than thirty (30) years ago from the University of Wisconsin. Since that time he has worked on numerous projects involving disposable products made from or incorporating polymeric materials such as paper products with polymer coatings and plastic products made from polystyrene, polyethylene, polypropylene, polyethylene terephthalate and the like. Over the course of this experience he has become familiar with fabrication techniques for polymer materials such as thermoforming, injection molding, injection blow-molding, injection stretch blow-molding and so forth.
2. That he is familiar with the Official Action finally rejecting the claims of the above-noted patent application dated October 18, 2002, as well as United States Patent No. 5,433,337 to *Willbrandt* which is the primary basis for the rejections made over prior art.

3. *Willbrandt* '337 makes reference to injection molding, blow-molding, vacuum forming, stretch molding and states that injection molding is a preferred method of making the cup illustrated in the '337 patent. Col. 5, lines 29-35. The injection blow-molding process used to make the cups of the above-noted patent application is not mentioned. A brief summary of the various processes used to make plastic cups is given below because the recognized differences between the processes and the products so made are believed pertinent to the invention of the above-noted patent application.
4. With respect to plastic disposable cups, in general, one of skill in the art recognizes that injection molded disposable cups, injection blow-molded disposable cups, blow-molded disposable cups such as stretch blow-molded disposable cups, and thermoformed disposable cups are distinct products with different structural attributes.
5. Injection molded cups may readily be prepared with different thicknesses in different areas, as described in the '337 *Willbrandt* patent noted above. These cups are generally prepared by injecting molten plastic into a mold under high pressure and are characterized by a high degree of uniaxial material orientation in the direction of material flow in the mold. That uniaxial orientation is a structural feature which increases strength in the machine direction and results in brittleness in the cross-machine direction.
6. Injection blow-molded cups, such as those of the invention, are prepared in a multistep integrated process by injecting molding a parison and then blow-molding the hot parison with a compressed gas into the desired final shape. The parison is expanded in a radial, but not axial direction. The step of blow-molding the hot parison imparts biaxial orientation to the final product. Biaxial orientation is a structural feature related to the ratio of the volume of the final product to the volume of the parison and imparts toughness to the article as taught in the above-noted patent application.
7. Stretch blow-molding and blow-molding processes typically involve injection molding a parison in an injection molding machine followed by removing the parison from the apparatus and blow-

molding the parison in a separate apparatus, unlike the injection blow-molding process described above which is an integrated process. Stretch blow-molded and blow-molded products often have a very high degree of biaxial orientation because the parison is expanded in an axial as well as radial direction, but typically require neck features such as prominent annular ring to hold the parison in place during the blow-molding step.

8. Thermoformed articles are generally of relatively uniform thickness because they are prepared from sheets of thermoplastic material, vacuum formed into a mold, for example. Thermoformed articles are generally of relatively uniaxial polymer orientation like injection molded articles in many respects.
9. The cup illustrated in Figures 1-4 of the '337 patent has certain thickness requirements of the various parts of the cup. In this respect, Claim 1 of the '337 patent is illustrative:
 1. A container for a vehicle cup holder comprising:
 - a base;
 - a lower body portion extending substantially upward from said base, said lower body portion comprising a plurality of fluted sides;
 - a shoulder extending radially outward from said lower body portion;
 - each of said fluted sides comprising a substantially one-dimensional surface, said fluted sides increasing in thickness in an upward direction from about 0.008- about 0.025 inch at said base to about 0.040 inch-about 0.055 inch at a point where said lower body portion meets said shoulder, said lower body portion having a length of about 1-7/8 to about 2½ inches; and
 - an upper body portion extending substantially upward from said shoulder to create an opening, the upper body portion having a substantially constant thickness of about 0.030 to about 0.040 inches, said upper body portion increasing in diameter as it extends upward, said upper body portion having a length of about 4.500 to about 5.250 inches, said upper body portion having an overall greater diameter than said lower body portion.
10. Based on his experience, such thickness features, while readily achieved in connection with injection molded products, would be extremely difficult to achieve with other fabrication techniques such as thermoforming or stretch blow-molding and would likely be impossible to achieve in an injection blow-molding process because of the inherent complexity of the process. In an injection blow-molding process, thickness features would need to be molded into the

parison, followed by blow-molding the product while the parison was still hot enough to be formed into shape. Because thick portions take longer to heat and cool, it is unlikely, in his opinion, an injection blow-molding process could be employed to make the cup illustrated in the '337 *Willbrandt* patent. The various thicknesses would lead to temperature differences which would lead to uncontrolled stretching of the parison when it was expanded in a blow mold.

11. The cups or tumblers of the present invention are of the injection blow-molded variety as is seen from amended Claim 1 of the above-noted application:

1. An injection blow-molded tumbler formed from a polymeric material comprising:
 - (a) a base defining a base diameter forming the bottom of said tumbler, the base also defining an outer edge thereof;
 - (b) a sidewall integrally formed with said base extending upwardly from the outer edge thereof defining about its upper extremity an opening having a diameter generally larger than the base diameter provided with a fortified rim integrally formed with the sidewall in the form of a continuous solid polymer bead;

wherein said fortified rim has a thickness from about 1.5 to about 6 times the thickness of the adjacent portion of said sidewall and wherein the volume of the injection blow-molded tumbler is from about 1.5 to about 4 times the volume of an injection molded parison from which it was prepared.

12. There are at least three aspects to the claimed subject matter above which involve unexpected and, in my opinion, surprising, results. First, the cups of the invention were found to decrease "lip feel" negatives to a surprising degree over prior art injection blow-molded cups. Second, the cups of the invention are surprisingly impact-resistant as compared with prior art injection blow-molded cups. Finally, the cups of the invention with a compact, solid brim, were unexpectedly suitable for the injection blow-molding process. The process is basically that described in United States Patent No. 4,540,543. The integrated injection blow-molding process is readily distinguished from other blow-molding techniques for making cups due to the requirement that the parison must be retained in place by its brim.

13. With respect to the data which follows, the cups tested were 16 oz. cups as shown generally in Figure 8 of the above-noted application. The cups of the invention tested had a 63 mil (0.063") beaded brim as shown in Figure 4B of the above-noted application and the other cups had a curled, "U" shaped rim as shown in Figure 4A of the above-noted application having a 125 mil wide brim and an 85 mil wide brim. The various geometric features are summarized in Figure 1:

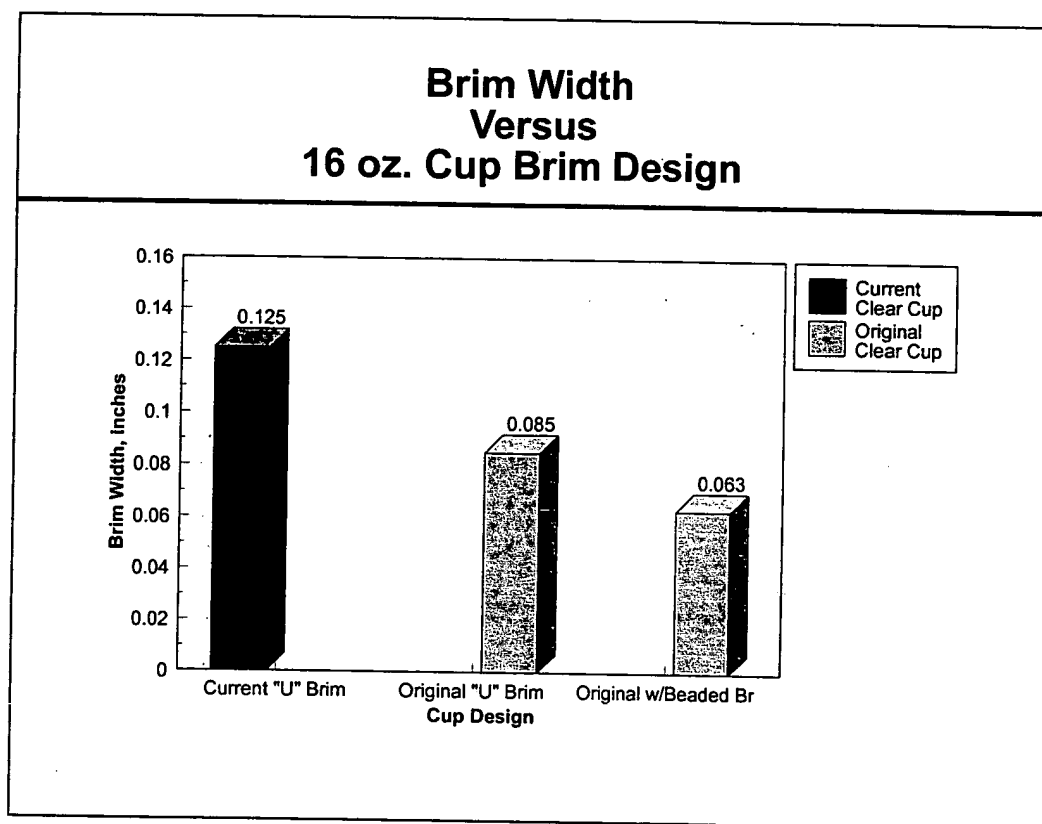


Figure 1

In Figure 1, as well as Figures 2 and 3 below, the cups of the invention are designated "Original w/Beaded Br". Cups with a 125 mil "U" shaped brim are designated "Current "U" Brim" and cups with an 85 mil "U" shaped brim are designated "Original "U" Brim".

14. The cups were compared for "Lip Feel Negatives" using a non-directed panel. These evaluations

were conducted by providing panelists with a cup of water and asking them to drink. Panelists were then asked to comment on anything they liked or disliked about the experience. A Lip Feel Negative was recorded when a panelist remarked that the brim felt uncomfortable or "sharp" on the lips. Oftentimes such remarks were the panelists' first comments, despite the fact that the panelists were not directed in any way to a feature of the cup.

Results appear in Figure 2 below:

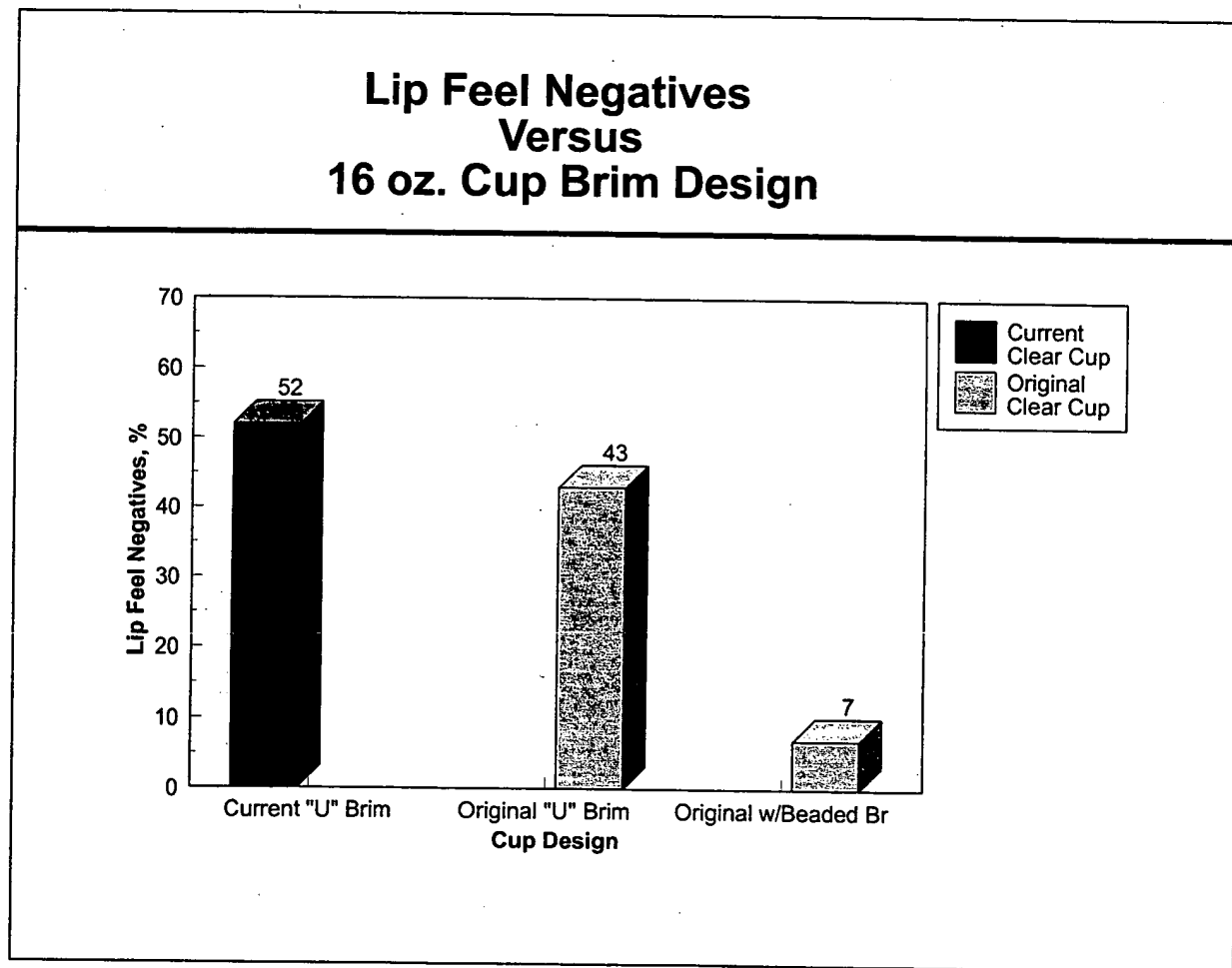


Figure 2

It can be seen in Figure 2 that the lip feel negatives were dramatically reduced by a factor of 6 or more. In my opinion, this is a surprising finding, one which is of significant commercial

significance. Thermoformed cups typically have a fully rolled brim without edges, so that lip feel is less of an issue.

15. The cups were also compared for impact resistance using generally the procedure described in the above-noted patent application at pages 60-61. Results appear in Figure 3.

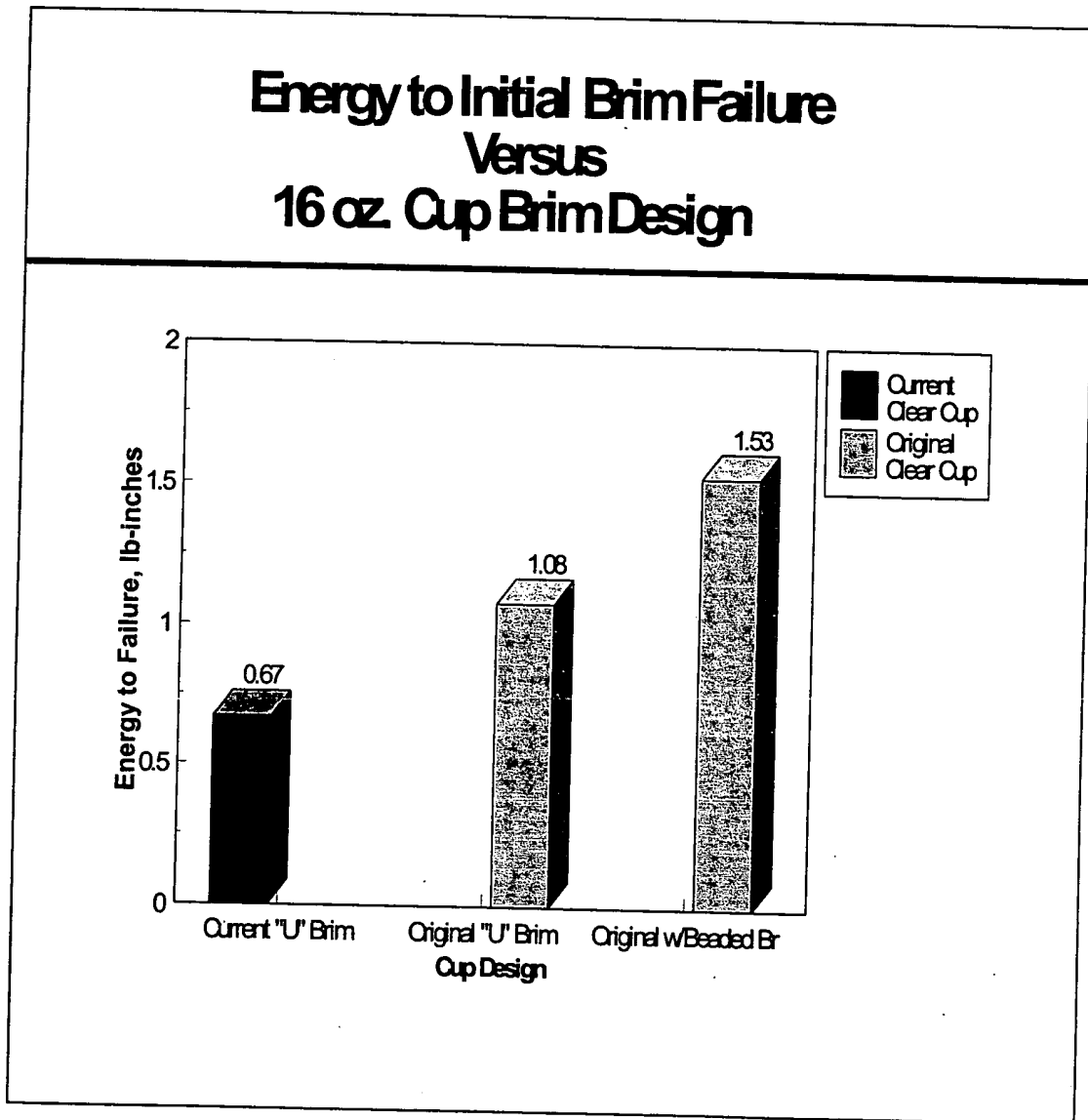


Figure 3

Here again, it is seen that the cups of the invention exhibited an unexpected and surprising increase in impact resistance; more than 100% increase in impact energy at failure versus cups with a 125 mil curled brim. This unexpected result was, in my opinion, surprising. Note also that these results are similar to those initially found and reported in Table 3 of the above-noted application.

16. Another unanticipated result found in connection with the above-noted invention was that the solid rim of much smaller size than prior art "U" shaped rims was sufficient to hold the product in place during the integrated injection blow-molding fabrication process, which is described generally in United States Patent No. 4,540,543. Conventional wisdom was that a "U" shaped curl on the product was necessary in order to hold the product in place during the fabrication process. In fact, engineers and operators of the process told me that a compact, rounded solid rim would not work in the process. In my opinion, the fact that the products of the invention can be made by way of the injection blow-molding without special equipment and without unwanted features to hold the parison in place is an unexpected and surprising aspect of the invention.
17. The undersigned Declarant declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the subject application or any patent issuing thereon.

Signed this 15 day of January, 2003


Erland R. Sandstrom